

PATENT SPECIFICATION

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(54) A REPLACEABLE CAP FOR THE SENSING PROBE OF AN ELECTRONIC DEVICE FOR MEASURING BODY TEMPERATURE, AND A METHOD OF PRODUCING SUCH A CAP

(71) I, ALFRED SCHILLER, of Swiss nationality, of Registrasse 4, 8910 Affoltern a.A., Switzerland, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to a replaceable cap for the sensing probe of an electronic device for measuring body temperature, and to a method for the production thereof.

In the present state of the art in the measurement of body temperature by means of an electronic device equipped with a sensing probe, the question of sterilization of the sensing probe, which is that part of the device which comes into contact with the patient, is solved mainly in one of the following three ways.

1. The same sensing probe is used for all patients, the probe being covered before each measurement, by means of a replaceable sterile sensing probe cap which is discarded after use.

2. The same sensing probe is used for all patients, and is sterilized on the conclusion of each measurement.

3. Each patient receives his own sterile sensing probe which is connected to a measuring and indicating device before measurement. The individual probes are sterilized again after conclusion of the measurements.

The first of the above possibilities has proved the most favourable solution to nursing staff and to doctors, both as regards time required and convenience since no sterilization operation is necessary either between measurements or afterwards. As far as measurement itself is concerned, however, this solution has the danger that depending upon the type of construction the sensing probe cap may delay the probe's assuming the same temperature as the body of the patient, so that the main advantage of

the electronic device for measuring body temperature, i.e. the short measuring period, is lost.

It is known to use long narrow plastic bags as sensing probe caps, these being fitted loosely over the probe. This solution gives very indeterminate contact conditions between the probe and the cap, and this may impair the speed of measurement and accuracy.

Devices are also known in which stiff plastics covers are used, which are so pulled over the probe by mechanically actuated grippers that the tip of the probe is pressed against the base of the cover. Although this solution gives accurately defined contact conditions, the contact surface between the probe and the cover is small, and this again results in a longer measuring time.

It is an object of the present invention to obviate the known disadvantages which may occur using sensing probe caps. To this end, according to one aspect of the invention there is provided a replaceable cap for the sensing probe of an electronic device for measuring body temperature, said cap comprising a rigid tube one end of which is closed by a resilient diaphragm of elastomeric material stretched over said one end of said rigid tube, and the other end of which is open, whereby the cap can be drawn over a measuring probe with said resilient diaphragm stretched over the free end of the probe and can be held in position by grippers engaging said other end of the rigid tube.

According to another aspect of the invention there is provided a method of producing a replaceable sensing probe cap according to the above aspect of the invention, in which method one end of a rigid tube, open at both ends, is immersed in a solution of an elastomeric material in a solvent, so that the drop of solution forming at said one end of the tube on withdrawal of the latter from the solution is converted,

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after vaporization of the solvent, into a resilient diaphragm which closes said one end of the tube.

5 The advantage of the invention is more particularly that the resilient diaphragm of elastomeric material is ideally stretched over the front part of the sensing probe where the actual temperature sensing element is situated. This ensures reliable 10 and satisfactorily conductive thermal contact.

An embodiment of the invention is described below by way of example with reference to the accompanying drawings 15 wherein:

Figure 1 is a sectional view of a sensing probe cap; and

20 Figure 2 is a view showing a sensing probe fitted with the sensing probe cap of Figure 1.

25 Referring to Figure 1, a rigid thin-walled tube 1 is closed at its lower end by a resilient diaphragm 2 of elastomeric material such as rubber. The upper end of the tube is formed with an outwardly directed flange 3 adapted to be engaged by grippers 4 of a measuring probe (see Figure 2).

30 The tube 1 may be of a synthetic plastics material for example PVC or polyethylene, or of metal, for example aluminium. In the case of thermoplastics material the flange 3 is formed preferably by deformation of the tube after heating, while in the case of a metal tube it is formed by mechanical action. To produce the resilient diaphragm 35 2, the lower end of the tube 1 is immersed, for example in a solution of rubber in a suitable solvent so that when it is withdrawn a drop of this solution remains suspended at 40 the lower end of the tube. After vaporization of the solvent a thin resilient rubber diaphragm remains and closes the bottom end of the tube. The flange 3 may be formed before or after the resilient 45 diaphragm is formed.

Figure 2 shows how the resilient diaphragm 2 ideally matches the sensing probe tip 6 as soon as the sensing probe cap is pulled up by the grippers 4. The latter may 50 be actuated, for example, by operating a press button 5.

55 The tube 1 is formed with the thinnest possible wall consistent with its remaining rigid enough for engagement by the grippers 4, both in the interests of economy and to ensure good heat conduction.

WHAT I CLAIM IS:—

1. A replaceable cap for the sensing probe of an electronic device for measuring body temperature, said cap comprising a rigid tube one end of which is closed by a resilient diaphragm of elastomeric material stretched over said one end of said rigid tube, and the other end of which is open, whereby the cap can be drawn over a measuring probe with said resilient diaphragm stretched over the free end of the probe and can be held in position by grippers engaging said other end of the rigid tube. 60

2. A replaceable sensing probe cap as claimed in Claim 1, wherein said other end of the rigid tube is provided with a flange for engagement by the grippers. 70

3. A replaceable sensing probe cap as claimed in Claim 1 or Claim 2, wherein said tube is of synthetic plastics material. 75

4. A replaceable sensing probe cap as claimed in Claim 1 or Claim 2, wherein said tube is of metal. 80

5. A method of producing a replaceable sensing probe cap according to any preceding claim, in which method one end of a rigid tube, open at both ends, is immersed in a solution of an elastomeric material in a solvent so that the drop of solution forming at said one end of the tube on withdrawal of the latter from the solution is converted, after vaporization of the solvent, into a resilient diaphragm which closes said one end of the tube. 85

6. A replaceable cap for the sensing probe of an electronic device for measuring body temperature substantially as hereinbefore described with reference to and as shown in the accompanying drawings. 90

7. A method of producing a replaceable cap for the sensing probe of an electronic device for measuring body temperature, substantially as hereinbefore described. 95

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COMPLETE SPECIFICATION

1 SHEET

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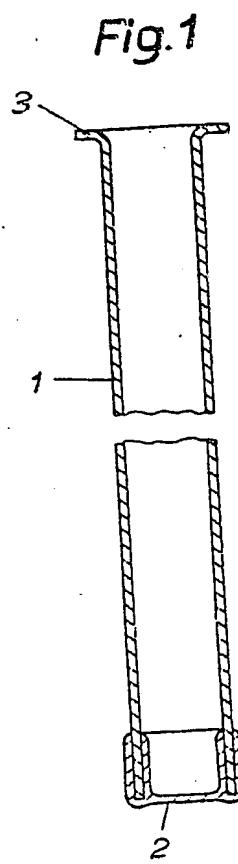


Fig. 2

